

TOTAL-INTENSITY RESIDUAL MAGNETIC PROFILES, CHUKCHI SEA

Total-intensity magnetic data were recorded by a Varian model proton-precession magnetometer aboard the U.S. Coast Guard cutter *Storis* along 1,250 nautical miles of track line in the northern Chukchi Sea during the period August 28 to September 11, 1969. Residual magnetic anomalies were computed by (1) correcting the original data for diurnal variations of the earth's magnetic field and (2) subtracting from the diurnally-corrected data the standard regional or normal part of the earth's field.

Correction for diurnal effects was applied for those variations which showed positive correlation between magnetic observatory records from Tin City and Barrow. About 80% of the recorded data required corrections of less than 15 gammas; the maximum correction was 50 gammas.

The regional or normal magnetic field to which the diurnally-corrected data are referred is the IGRF (International Geomagnetic Reference Field), Epoch 1965.0. Values of this reference field were plotted on a 2-degree grid of latitude and longitude and subsequently contoured. IGRF grid values within the study area ranged approximately from 55,400 to 57,300 gammas.

Residual magnetic anomaly profiles were constructed along line segments that approximately follow the more irregular ship tracks (Plate 1). Data were orthogonally projected from these ship tracks to the anomaly profile traces. The profile traces are marked by single- or double-primed letters and numerals at their end points and turning points. Ship tracks are shown as dashed lines.

Anomaly profiles are shown in Plate 2 relative to arbitrary magnetic datums. Ship track lines are considered too sparse and discontinuous for reliable contouring of data except within a local area (near trace G'-J') which has been previously surveyed (Bassinger, 1968). The following magnetic datum values are provided:

Profile trace point	Approx. diurnally-corrected value	Approx. IGRF value	Approx. residual anomaly value
A'	55,270 γ	55,430 γ	-160 γ
D'	55,750 γ	55,850 γ	-100 γ
F'	56,550 γ	56,580 γ	-30 γ
P'	56,550 γ	56,630 γ	-80 γ
S'	56,580 γ	56,700 γ	-120 γ
X'	56,480 γ	56,650 γ	-170 γ
I'	56,580 γ	56,610 γ	-30 γ

Based on IGRF datum, the residual anomaly values in the surveyed area range from as high as +360, +310, and +260 gammas along traces J'-K' (near J'), G'-J', and J'-K' (near K'), respectively, to as low as -175 and -160 gammas along traces X'-I' and A'-B' (at A'), respectively.

Magnetic data at ship track crossings show discrepancies of about 25 gammas except for the crossing of A'-B' and C'-D' which has an uncertainty of about 80 gammas. The following uncertainty estimates apply to the various track crossings:

Ship track crossing	Magnetic anomaly uncertainty estimate
A'-B' and C'-D'	80 γ
A'-B' and D'-E'	25 γ
E'-C' and D'-E'	25 γ
C'-D' and E'-F'	25 γ
D'-E' and F'-G'	no est.; fouled tow unit
D'-E' and G'-J'	no est.; extremely high gradients
G'-J' and I'-J'	25 γ
Q'-R' and S'-T'	10 γ

REFERENCE

Bassinger, B. G., 1968, Marine magnetic study in the northeast Chukchi Sea: Jour. Geophys. Research, v. 73, no. 2, p. 683-687.

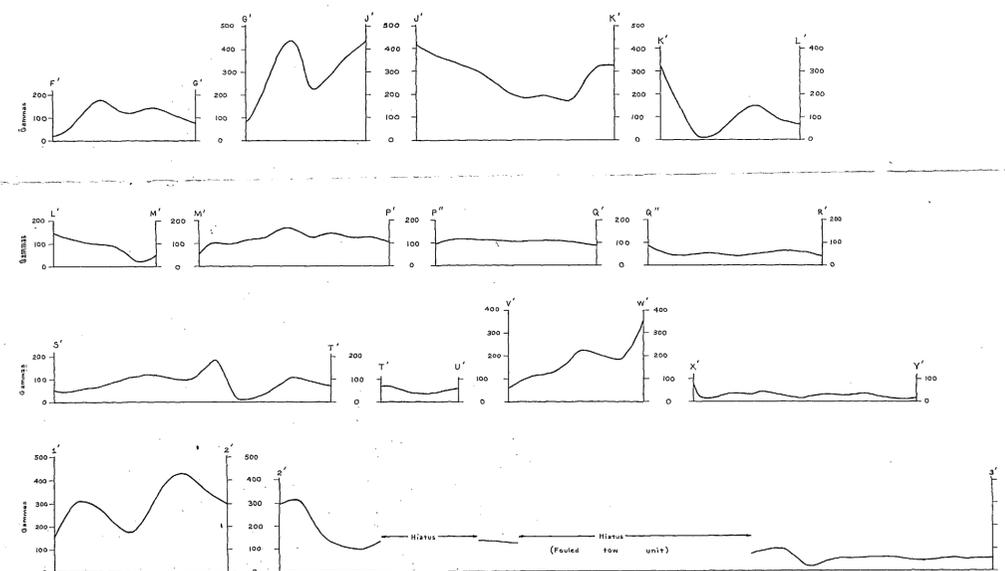
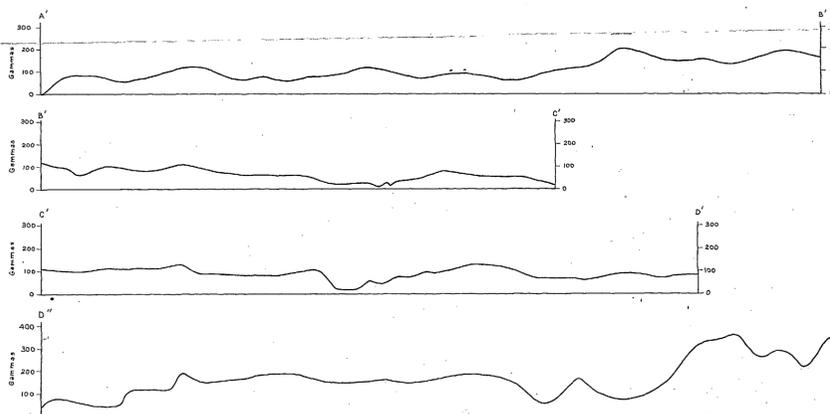
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TRACE LINES OF TOTAL INTENSITY RESIDUAL MAGNETIC PROFILES, CHUKCHI SEA, 1969



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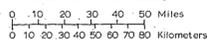
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Profiles not adjusted to common datum.

TOTAL-INTENSITY RESIDUAL MAGNETIC PROFILES, CHUKCHI SEA, 1969



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